

Coupled periodic waveguides: From basic idea to efficient photonics components

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An efficient light guiding by several periodic chains of dielectric nanopillars is possible [1]. Periodicity in the guiding direction and coupling between the individual chains lead to strong frequency dispersion of such coupled periodic waveguide (CPW). In this contribution, we study dispersion and transmission properties of CPWs with the aim to design effective and compact photonics components. Bends, directional couplers (Fig. 1) and filters are proposed and numerically characterized by 2D and 3D plane wave expansion and finite difference time domain methods.

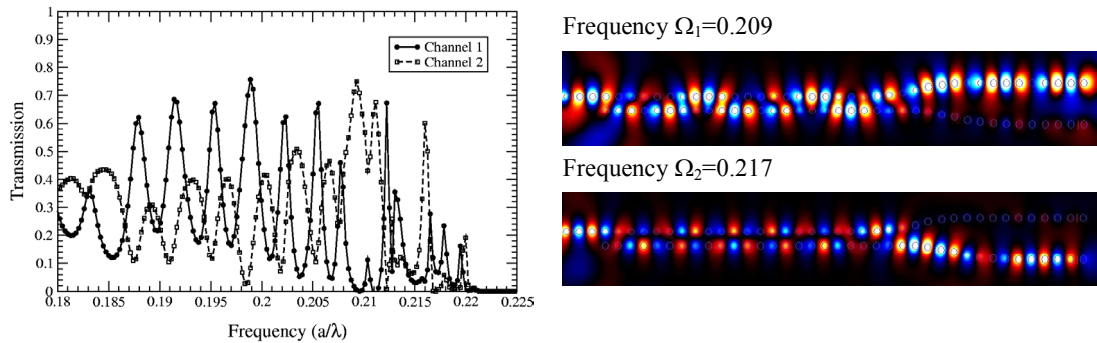


Figure 1. Transmission efficiency (left) and field distribution (right) of a CPW directional coupler.

[1] D. N. Chigrin, et al., *Opt. Express* **12**, 617 (2004)